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EXAMINER

RIELLEY, ELIZABETH A

ART UNIT PAPER NUMBER

2879

DATE MAILED: 04/07/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/698,357

Applicant(s)

CHOI, OH-YONG

Examiner

Elizabeth A. Rielley

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 18 January 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-20 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 1/31/06
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Response to Amendment

Amendment filed 1/18/2006 has been entered and considered by the Examiner. Currently, claims 1-20 are pending in the instant application.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-7 and 11-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nose et al (US 6104132) in view of Tani et al (US 6268688).

In regard to claims 1 and 11, Nose et al ('132) teach a cathode ray tube comprising: a panel (1; figure 1; column 5 lines 20-29); a shadow mask (6) installed with a certain interval from an inner surface of the panel (see figure 1), having a plurality of apertures through which electron beams pass (13), and formed as a pin-cushion shape in which long and short sides of the shadow mask are inwardly concaved (see figure 2); and the mask frame (7) for fixing and supporting the shadow mask (see figure 2). Nose et al ('132) are silent regarding the limitations of a panel of which an outer surface is substantially flat and

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wherein long and short sides of the mask frame are slanted from ends toward centers thereof in order to maintain a predetermined interval with the long and short sides of the shadow mask. Tani et al ('688) disclose a panel for a cathode ray tube that is substantially flat (1; column 7 lines 5-22) and the long and short sides of the mask frame are slanted from ends toward centers thereof in order to maintain a predetermined interval with the long and short sides of the shadow mask (figure 4; column 4 line 60 to column 5 line 39; abstract) in order to improve the mechanical strength of the display (column 7 lines 14-19). Hence, it would have been obvious at the time of the invention to one of ordinary skill in the art to combine the CRT of Nose et al with the panel and frame of Tani et al ('688). Motivation to combine would be to improve the mechanical strength of the display.

In regard to claims 2 and 12, Nose et al ('132) teach the long and short sides of the mask frame are curvedly formed to have predetermined curvatures from ends to centers thereof (figure 8; column 9 lines 26-35).

In regard to claims 3 and 13, Nose et al ('132) teach the following conditions are satisfied, $R1 > R3$, $R2 > R4$, in which $R1$ denotes a radius of curvature of the long side of the mask frame, $R2$ denotes a radius of curvature of the short side of the mask frame, $R3$ denotes a radius of curvature of the long side of the shadow mask, and $R4$ denotes a radius of curvature of the short side of the shadow mask (column 6 lines 52-53).

In regard to claims 4 and 14, Nose et al ('132) teach the following condition is satisfied, $R3 > R4$ (claim 20; only one of the sides needs a curvature, the other would be zero).

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In regard to claims 5 and 15, Nose and Tani disclose the claimed invention except for wherein following conditions are satisfied, $0.3 \leq DLc/DLi \leq 0.5$, $0.3 \leq DSc/DSi \leq 0.5$, in which DLc denotes an interval between the center of the long side of the shadow mask and the center of the long side of the mask frame, DSc denotes an interval between the center of the short side of the shadow mask and the center of the short side of the mask frame, DLi denotes an interval between the center of the long side of the shadow mask and a center of an imaginary line connecting both ends of the long side of the mask frame, and DSi denotes an interval between the center of the short side of the shadow mask and a center of an imaginary line connecting both ends of the short side of the mask frame. It would have been obvious to one having ordinary skill in the art at the time the invention was made to have the following conditions satisfied, $0.3 \leq DLc/DLi \leq 0.5$, $0.3 \leq DSc/DSi \leq 0.5$, in which DLc denotes an interval between the center of the long side of the shadow mask and the center of the long side of the mask frame, DSc denotes an interval between the center of the short side of the shadow mask and the center of the short side of the mask frame, DLi denotes an interval between the center of the long side of the shadow mask and a center of an imaginary line connecting both ends of the long side of the mask frame, and DSi denotes an interval between the center of the short side of the shadow mask and a center of an imaginary line connecting both ends of the short side of the mask frame, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. *In re Aller*, 105 USPQ 233. Please see additional details below.

In regard to claims 6 and 16, Nose teach all the limitations set forth, as described above, except width of the slanted portion of the long side slanted from the end of the long side of the mask frame toward the center thereof is equal to or larger than 70% of a width from the end of the long side of the mask frame toward the center thereof, and a width of the slanted portion of the short side slanted from the end of the short side of the mask frame toward the center thereof is equal to or larger than 70% of a width

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from the end of the short side of the mask frame toward the center thereof. Tani et al ('688) teach a width of the slanted portion of the long side slanted from the end of the long side of the mask frame toward the center thereof is equal to or larger than 70% of a width from the end of the long side of the mask frame toward the center thereof, and a width of the slanted portion of the short side slanted from the end of the short side of the mask frame toward the center thereof is equal to or larger than 70% of a width from the end of the short side of the mask frame toward the center thereof (column 5 lines 25-39; column 7 lines 23-42) in order to reduce the difference in temperature within the CRT (column 5 lines 26-54). Hence, it would have been obvious at the time of the invention to one of ordinary skill in the art to combine the CRT of Nose et al with the frame of Tani et al ('688). Motivation to combine would be to reduce the difference in temperature within the CRT.

In regard to claims 7 and 17, Nose and Tani disclose the claimed invention except for having the following conditions satisfied $0.3 \leq DL3/DLi \leq 0.5$, $0.3 \leq DS3/DSi \leq 0.5$, in which DL3 denotes an interval between the mask frame and the shadow mask at a position which is located at 70% of a distance from the end of the long side of the mask frame toward the center thereof, DS3 denotes an interval between the mask frame and the shadow mask at a position which is located at 70% of a distance from the end of the short side of the mask frame toward the center thereof, DLi denotes an interval between the center of the long side of the shadow mask and a center of an imaginary line connecting both ends of the long side of the mask frame, and DSi denotes an interval between the center of the short side of the shadow mask and a center of an imaginary line connecting both of the short side of the mask frame. It would have been obvious to one having ordinary skill in the art at the time the invention was made to have the following conditions satisfied: $0.3 \leq DL3/DLi \leq 0.5$, $0.3 \leq DS3/DSi \leq 0.5$, in which DL3 denotes an interval between the mask frame and the shadow mask at a position which is located at 70% of a distance from the end of the long side of the mask frame toward the center thereof, DS3 denotes an interval between the mask frame

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and the shadow mask at a position which is located at 70% of a distance from the end of the short side of the mask frame toward the center thereof, DLi denotes an interval between the center of the long side of the shadow mask and a center of an imaginary line connecting both ends of the long side of the mask frame, and DSi denotes an interval between the center of the short side of the shadow mask and a center of an imaginary line connecting both of the short side of the mask frame, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. *In re Aller*, 105 USPQ 233. Please see additional details below

Claims 8-9 and 18-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nose et al (US 6104132) in view of Tani et al (US 6268688) and in further view of Tsuneta et al (US 373703).

Nose/Tani teach all the limitations set forth, as described above, except following conditions are satisfied $0^\circ \leq Lcor \leq 15^\circ$ or $0^\circ \leq Scor \leq 15^\circ$, in which Lcor denotes a slanted angle from the end of the long side of the mask frame toward the center thereof, and Scor denotes a slanted angle from the end of the short side of the mask frame toward the center thereof. Tsuneta et al teach following conditions are satisfied $0^\circ \leq Lcor \leq 15^\circ$ or $0^\circ \leq Scor \leq 15^\circ$, in which Lcor denotes a slanted angle from the end of the long side of the mask frame toward the center thereof ($a2=15^\circ$; column 5 lines 23-56), and Scor denotes a slanted angle from the end of the short side ($a3=15^\circ$) of the mask frame toward the center thereof, as well as $0^\circ < Lcor \leq Scor \leq 10^\circ$ ($a2=10$; column 5 line 50-51; $a3 \leq 10$; column 5 lines 53-56) in order to minimize the strain in the frame (column 5 lines 50-55). Hence, it would have been obvious at the time of the invention to one of ordinary skill in the art to combine the CRT of Nose/Tani with the frame angles of Tsuneta in order to minimize the strain in the frame.

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Claims 10 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nose et al (US 6104132) in view of Tani et al (US 6268688).

Nose/Tani teach all the limitations set forth, as described above, except an interval between the shadow mask and the mask frame is equal to or larger than 2.6mm. However, Nose et al ('132) teaches the distance between the mask frame and the shadow mask is decreased in order to improve magnetic shielding effect (column 3 lines 7-59) and thereby improving operating effect (column 10 lines 25-36). Therefore, since it was known at the time of the invention that by shortening the interval between the shadow mask and the shadow mask frame, an improvement may be made to the displacement of the electron beam according to an influence of a magnetic field (that is, the displacement effects the magnetic shielding which in turn effects the operation of the device, the electron beams), the general conditions of the stated claim are disclosed in the prior art. Therefore, discovering the optimum or workable ranges of this general condition would involve only routine skill in the art. *In re Aller*, 105 USPQ 233. Therefore, the prior art of record teaches all the limitations in the current application.

Response to Arguments

Applicant's arguments filed 1/18/06 have been fully considered but they are not persuasive.

In regard to Applicant's argument that the prior art of record fails to teach that the long and short sides of the mask frame are slanted from ends towards centers thereof, the Examiner respectfully disagrees. Tani et al ('688) teaches the long and short sides of the mask frame are slanted from ends towards centers thereof (figure 4; column 4 line 60 to column 5 line 39; abstract) in order to improve the

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mechanical strength of the display (column 7 lines 14-19). Therefore, the prior art of record teaches all the limitations in the current application.

In regard to Applicant's argument that the prior art of record fails to teach a flat cathode ray tube, the Examiner respectfully disagrees. Tani et al ('688) teaches a flat cathode ray tube so that the outer surface of the effective portion of the panel has a substantially infinitely large radius of curvature (column 1 lines 5-22). Therefore, the prior art of record teaches all the limitations in the current application.

In response to applicant's argument that the examiner's conclusion of obviousness is based upon improper hindsight reasoning, it must be recognized that any judgment on obviousness is in a sense necessarily a reconstruction based upon hindsight reasoning. But so long as it takes into account only knowledge which was within the level of ordinary skill at the time the claimed invention was made, and does not include knowledge gleaned only from the applicant's disclosure, such a reconstruction is proper. See *In re McLaughlin*, 443 F.2d 1392, 170 USPQ 209 (CCPA 1971).

In regard to Applicant's argument that the prior art of record fails to teach at least one of the long and short sides of the mask frame is concaved toward an inside of the mask frame, the Examiner respectfully disagrees. Nose et al ('132) teaches at least one of the long and short sides of the mask frame is concaved toward an inside of the mask frame (see figure 2, column 3 lines 7-10). Therefore, the prior art of record teaches all the limitations in the current application.

In regard to Applicant's argument that the prior art of record fails to teach the following conditions are met: $0.3 \leq DLc/DLi \leq 0.5$, $0.3 \leq DSc/DSi \leq 0.5$, the Examiner respectfully disagrees. DLc and DLi are intervals between the center of the short side of the shadow mask and the short side of the center

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mask frame. DSc and DSi denotes intervals between the center of the short side of the shadow mask and a center of an imaginary line connecting both ends of the short side of the mask frame. In short, the relationships describe spacing of the shadow mask and the shadow mask frame. Page 14 of Applicant's specification teaches that by reducing the interval between the long and short sides of the mask and frame, the displacement of the electron beam according to an influence of a magnetic field can be decreased. Nose et al ('132) teaches the distance between the mask frame and the shadow mask is decreased in order to improve magnetic shielding effect (column 3 lines 7-59) and thereby improving operating effect (column 10 lines 25-36). Therefore, since it was known at the time of the invention that by shortening the interval between the shadow mask and the shadow mask frame, an improvement may be made to the displacement of the electron beam according to an influence of a magnetic field (that is, the displacement effects the magnetic shielding which in turn effects the operation of the device, the electron beams), the general conditions of the stated claim are disclosed in the prior art. Therefore, discovering the optimum or workable ranges of this general condition would involve only routine skill in the art. *In re Aller*, 105 USPQ 233. Therefore, the prior art of record teaches all the limitations in the current application.

In regard to Applicant's argument that the prior art of record fails to teach width of the slanted portion of the long side slanted from the end of the long side of the mask frame toward the center thereof is equal to or larger than 70% of a width from the end of the long side of the mask frame toward the center thereof, and a width of the slanted portion of the short side slanted from the end of the short side of the mask frame toward the center thereof is equal to or larger than 70% of a width from the end of the short side of the mask frame toward the center thereof, the Examiner respectfully disagrees. Tani et al ('688) teaches width of the slanted portion of the long side slanted from the end of the long side of the mask frame toward the center thereof is equal to or larger than 70% of a width from the end of the long side of the mask frame toward the center thereof, and a width of the slanted portion of the short side

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slanted from the end of the short side of the mask frame toward the center thereof is equal to or larger than 70% of a width from the end of the short side of the mask frame toward the center thereof (column 5 lines 25-39; column 7 lines 23-42) in order to reduce the difference in temperature within the CRT (column 5 lines 26-54). Even though Tani expresses this concept in a different way, the phrase “80% of the length of each long side wall except both ends positions thereof, the edge of the long side wall on the side of the phosphor screen is cut off” indicates that 80% of the length of the long side wall is cut off with the exception of the edges, which are at their original height. Therefore, a width of the slanted portion of the long side slanted from the end of the long side of the mask frame toward the center thereof is equal to or later than 70% (since Tani teaches 80% is cut off) of a width from the end of the long side of the mask frame toward the center thereof, and a width of the slanted portion of the short side slanted from the end of the short side of the mask frame toward the center thereof is equal to or larger than 70% of a width from the end of the short side of the mask frame toward the center thereof (see column 7 lines 23-42 where Tani teaches that the side wall is higher at the ends of the short axis of the mask frame like the long sides of the mask frame). Therefore, the prior art of record teaches all the limitations in the current application.

In regard to Applicant's argument that the prior art of record fails to teach a proper motivation of coming the side walls of Tani with Nose, since the motivation “to reduce the difference in temperature within the CRT” is ascribed to making the height of the central portion of the long side wall lower than the end portions, the Examiner respectfully disagrees. Tani does indeed teach making the height of the central portion of the long side wall of the mask frame lower than the end portions. Please see the argument above on how that reads on applicant's recited limitation. Therefore, the motivation is proper and relevant to the indicated claim.

In regard to Applicant's argument that the prior art of record fails to teach $0^\circ \leq L_{cor} \leq 15^\circ$ or $0^\circ \leq S_{cor} \leq 15^\circ$, in which L_{cor} denotes a slanted angle from the end of the long side of the mask frame toward the center thereof, and S_{cor} denotes a slanted angle from the end of the short side of the mask frame toward the center thereof, the Examiner respectfully disagrees. Tsuneta et al ('703) teach $0^\circ \leq L_{cor} \leq 15^\circ$ or $0^\circ \leq S_{cor} \leq 15^\circ$, in which L_{cor} denotes a slanted angle from the end of the long side of the mask frame toward the center thereof ($a_2=15^\circ$; column 5 lines 23-56), and S_{cor} denotes a slanted angle from the end of the short side ($a_3=15^\circ$) of the mask frame toward the center thereof, as well as $0^\circ < L_{cor} \leq S_{cor} \leq 10^\circ$ ($a_2=10$; column 5 line 50-51; $a_3 \leq 10$; column 5 lines 53-56) in order to minimize the strain in the frame (column 5 lines 50-55 and S_{cor} denotes a slanted angle from the end of the short side of the mask frame toward the center thereof. Therefore, the prior art of record teaches all the limitations in the current application.

The Examiner would like to state that although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

In regard to Applicant's argument that the prior art of record fails to teach an interval between the shadow mask and the mask frame is equal to or larger than 2.6mm, the Examiner respectfully disagrees. Nose teaches the distance between the mask frame and the shadow mask is decreased in order to improve magnetic shielding effect (column 3 lines 7-59) and thereby improving operating effect (column 10 lines 25-36). Therefore, since it was known at the time of the invention that by shortening the interval between the shadow mask and the shadow mask frame, an improvement may be made to the displacement of the electron beam according to an influence of a magnetic field (that is, the displacement effects the magnetic shielding which in turn effects the operation of the device, the electron beams), the general conditions of

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the stated claim are disclosed in the prior art. Therefore, discovering the optimum or workable ranges of this general condition would involve only routine skill in the art. In re Aller, 105 USPQ 233. Therefore, the prior art of record teaches all the limitations in the current application. Therefore, the prior art of record teaches all the limitations in the current application.

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

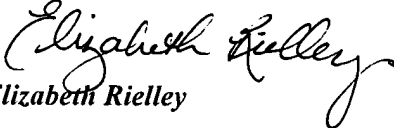
A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Elizabeth A. Rielley whose telephone number is 571-272-2117. The examiner can normally be reached on Monday - Friday 7:30 - 4:00.


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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nimeshkumar Patel can be reached on 571-272-2457. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


Elizabeth Rielley

Examiner
Art Unit 2879


MARICELI SANTIAGO
PRIMARY EXAMINER